

AMENDMENTS TO THE SPECIFICATION

Amend the paragraph at page 1, lines 4-10, as follows:

(Currently Amended): The present invention relates essentially to a ceramic board for the electrostatic chuck, wafer ~~prover prober~~ and other implements to be used in the manufacture of semiconductor apparatuses and more particularly to a ceramic board for semiconductor manufacture apparatuses which is capable of supporting large-sized semiconductor wafers and ~~these~~ does not adversely affect silicon wafers.

Amend the paragraph at page 1, lines 19-22, as follows:

(Currently Amended): In the above process for manufacturing a semiconductor chip, various semiconductor production implements each based on a ceramic board, such as the electrostatic chuck, hot plate, wafer ~~prover prober~~ and susceptor, are used on many occasions.

Amend the paragraph at page 5, lines 4-10, as follows:

(Currently Amended): The ceramic boards for semiconductor manufacture apparatuses according to the first and second aspects of the present invention preferably comprises

a conductor layer formed on the surface of said ceramic substrate and a semiconductor wafer mounted on said conductor layer,
said ceramic board functioning as a wafer ~~prover prober~~.

Amend the paragraph at page 6, line 28, as follows:

(Currently Amended): 101 wafer ~~prover prober~~

Amend the paragraph at page 8, lines 11-16, as follows:

(Currently Amended): The ceramic board for semiconductor manufacture apparatuses according to the present invention is not restricted to any particular kind insofar as it is used for the manufacture of implements for semiconductor manufacture apparatuses, but includes the electrostatic chuck, wafer ~~prover prober~~, susceptor, and hot plate (ceramic heater).

Amend the paragraph at page 9, line 31 through page 10, line 3, as follows:

(Currently Amended): If said flatness value is greater than 50 μm in the mode of use of the ceramic board for semiconductor manufacture apparatuses (hereinafter referred to briefly as ceramic board) as a wafer ~~prover prober~~, gaps will be created between the silicon wafer mounted and the surface of the ceramic substrate, and when the tester pin is depressed in the area corresponding to such a gap, the silicon wafer deforms in conformity with the surface undulation of the ceramic board and becomes damaged.

Amend the paragraph at page 10, lines 8-18, as follows:

(Currently Amended): The preferred value of said flatness is 1 to 20 μm . Thus, when the ceramic board of the present invention is used as a ceramic heater, no remarkable temperature gradient is produced in the silicon wafer. Also, when it is used as an electrostatic chuck, the variation in distance between the silicon wafer and the electrostatic chuck electrodes is small enough so that a sufficient chucking effect is produced and, moreover, the silicon wafer can be easily released from the ceramic substrate after use. When said ceramic board is applied to a wafer ~~prover prober~~, the deformation of the silicon wafer is so small that the incidence of wafer damage can be almost completely inhibited.

Amend the paragraph at page 10, lines 19-21, as follows:

(Currently Amended): The wafer ~~prover~~ prober is an instrument for use in a conduction test which comprises pressing tester pins against a silicon wafer placed thereon.

Amend the paragraph at page 13, lines 1-5, as follows:

(Currently Amended): When said conductor layer is to constitute the chuck top electrodes of a wafer ~~prover~~ prober, the particular conductor layer is formed on the surface of the ceramic substrate on the side on which a semiconductor wafer is mounted. The semiconductor wafer is mounted on this conductor layer.

Amend the paragraph at page 13, lines 13-20, as follows:

(Currently Amended): Since warp results in extension of the ceramics in the region farthest from the wafer-mounting surface, this warp is precluded by disposing a conductor layer as a reinforcement in the region of said extension, whereby the silicon wafer can be protected against damage. Then, in the mode of use as a wafer ~~prover~~ prober, an accurate conduction test can be carried out, while in the case of an electrostatic chuck, the reduction in the force of attraction acting on the silicon wafer can be prevented.

Amend the paragraph at page 14, lines 14-16, as follows:

(Currently Amended): The ceramic board provided with a heating element and others in this manner can be used as, for example, a hot plate (ceramic heater), an electrostatic chuck, or a wafer ~~prover~~ prober.

Amend the paragraph at page 32, line 4, as follows:

(Currently Amended): Example 4 (Manufacture of a wafer ~~prover~~ prober

Amend the paragraph at page 35, lines 6-10, as follows:

(Currently Amended): (11) Then, a plurality of thermocouples for temperature control were embedded in the cavities to obtain a wafer ~~prover~~ prober. The flatness of the wafer-mounting surface of this wafer ~~prover~~ prober was 15.5 μm in the X-direction and 12.4 μm in the Y-direction over a measurement range of 205 mm.

Amend the paragraph at page 35, lines 11-18, as follows:

(Currently Amended): (12) This wafer ~~prover~~ prober 101 was set on a stainless steel support 31 through a ceramic fiber (manufactured by Ibiden; trade name: Ibi-Wool) insulation 30 as shown in Fig. 8. This support 31 is provided with a plurality of nozzle ports 32 for ejecting a cooling medium to thereby adjust the temperature of the wafer ~~prover~~ prober 101. It is also provided with a suction port 33 for aspirating the cooling medium or air to thereby attract the silicon wafer.

Amend the paragraph at page 35, line 20, as follows:

(Currently Amended): Test Example 6 (Manufacture of a wafer ~~prover~~ prober)

Amend the paragraph at page 35, lines 21-23, as follows:

(Currently Amended): Except that diamond grinding was not performed, the procedure of Example 4 was otherwise repeated to provide a wafer ~~prover~~ prober.

Amend the paragraph at page 35, lines 24-26, as follows:

(Currently Amended): The flatness of the wafer-mounting surface of this wafer ~~prover~~ prober was 25.5 μm in the X-direction and 23.4 μm in the Y-direction over a measurement range of 205 mm.

Amend the paragraph at page 35, lines 29-31, as follows:

(Currently Amended): Except that a ceramic substrate rejected after hot-pressing was used, the procedure of Example 4 was otherwise repeated to provide a wafer ~~prover~~ prober.

Amend the paragraph at page 35, lines 32-34, as follows:

(Currently Amended): The flatness of the wafer-mounting surface of this wafer ~~prover~~ prober was 55 μm in the X-direction and 52 μm in the Y-direction over a measurement range of 205 mm.

Amend the paragraph at page 35, line 35 through page 36, line 4, as follows:

(Currently Amended): A silicon wafer was mounted on each of the wafer ~~provers~~ probers obtained in Example 4 and Test Example 6 and heated. With the wafer ~~prover~~ prober according to Example 4, the silicon wafer was not damaged. With the wafer ~~prover~~ prober according to Test Example 6, the wafer was destroyed.

Amended the paragraph at page 36, lines 5-9, as follows:

(Currently Amended): A silicon wafer was mounted on the wafer ~~prover~~ prober obtained in Comparative Example 7 and the temperature was increased to 200°C. However, because the wafer and the ~~prover~~ prober were in line contact, the wafer temperature failed to rise and the test could not be performed.

Amend the paragraph at page 36, lines 20-27, as follows:

(Currently Amended): As described above, the ceramic board for semiconductor manufacture apparatuses according to the present invention, when used as a heater, heats a silicon wafer uniformly throughout and, hence, does not damage the wafer and, when used as an electrostatic chuck, provides a sufficient chucking force, thus finding application as implements for semiconductor manufacture apparatuses, such as the hot plate, electrostatic chuck and wafer ~~prover~~ prober, with the outstanding advantage.

SUPPORT FOR THE AMENDMENT

This Preliminary Amendment amends the specification to correct a typographical error by replacing "wafer prover" with --wafer prober--. The skilled artisan would readily recognize that "prover" should be replaced with --prober--. The attached search for the term "wafer prober" in Abstracts of issued U.S. patents obtained forty hits. In contrast, the attached corresponding search for the term "wafer prover" obtained no hits. In addition, the attached Google search for "wafer prober" obtained 2,350 hits, while the attached Google search for "wafer prover" obtained only three hits. The attached U.S. Patent Nos. 4,934,064 and 5,773,951 show that a wafer prober is well-known in the art of semiconductor testing. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 10-15 will be pending in this application.

Claim 10 is independent.